

REMARKS:

Applicant has carefully studied the Final Examiner's Action and all references cited therein. The amendment appearing above and these explanatory remarks are believed to be fully responsive to the Action. Accordingly, this important patent application is now believed to be in condition for allowance.

Applicant responds to the outstanding Action by centered headings that correspond to the centered headings employed by the Office, to ensure full response on the merits to each finding of the Office.

Claim Rejections – 35 U.S.C. § 103

Applicant acknowledges the quotation of 35 U.S.C § 103(a).

Claims 1, 3-5, 7, 8, 12-14, 16, 17, 39 and 40-43 stand rejected under 35 U.S.C § 103(a) as being unpatentable over Narang (US 6,991,876) in view of Okamura (US 5,476,730) and Kordesch (3,944,435).

Claim 1 has been amended to more clearly describe that which the Applicant regards as the invention.

Amended claim 1 recites, “An electrochemical cell comprising: an aluminum anode; a first fiberglass cloth; a cathode comprising a woven metal electrode and a solid alkali peroxide, the cathode positioned adjacent to the first fiberglass cloth, the woven metal electrode of the cathode positioned such that the first fiberglass cloth is between the woven metal electrode and the aluminum anode and the solid alkali peroxide of the cathode positioned such that the woven metal electrode is between the solid alkali peroxide and the first fiberglass cloth and an aqueous electrolyte.”

The Office states, with respect to claim 1, that Narang teaches an electrochemical cell comprising an aluminum anode, a solid alkali metal peroxide cathode comprising sodium peroxide particulates and a separator comprising a fiberglass cloth between the anode and the cathode (Fig. 1; 4:7-10, 6:4-12, 8:1-8, Claim 1, Examples). The Office states that the cathode comprises a nickel current collector and the use of a glass woven separator between the anode

and the cathode (Fig. 1; Examples) and that since aluminum is taught as the anode material and not an alloy of aluminum, the teaching is interpreted as being pure aluminum.

The Office goes on to state that Narang is silent to the arrangement of the components such that the cathode current collector is between the fiberglass cloth and the solid alkali peroxide, but that Okamura teaches an air cell having a configuration with an anode, glass separator, cathode current collector and cathode active material. The Office states that the cathode collector of Okamura is a metal mesh, the anode is aluminum, the separator is a glass cloth and the electrolyte is potassium chloride (Fig. 1; 2:1-40), and as such, Okamura teaches arranging the similar components in a different manner to create a low degree of internal resistance and to generate a high current output (1:35-45).

Additionally, the Office concludes that it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the arrangement of components based on increasing the current output of the battery by decreasing the internal resistance. The Office states that the two prior arts illustrate that the arrangement does not alter the operation of the battery and as such combining the battery components according to known designs would be obvious to one skilled in the art at the time of the invention because combining prior art elements according to known methods to yield predictable results and using known techniques to improve similar devices in the same way are considered obvious to one of ordinary skill in the art (KSR, MPEP 2141 (III)).

The Office additionally states that it is noted that Narang's battery is based on a non-aqueous electrolyte and Okamura's battery is based on an aqueous electrolyte and that while the two electrolytes are not compatible, the chemistry of the two batteries is well known in the art and the physical arrangement of two batteries is transferable between the two types of electrolytes. The Office states that Kordesch teaches a physical arrangement for construction of a battery (Figs. 1-4; 3:45-55) and that the physical arrangement is applicable to a non-aqueous battery, an aqueous battery or a fuel cell (3:35-65, 6:10-30, 6:60-7:45). The Office contends that Kordesch teaches and supports that the physical arrangement of batteries are not limited to the type of electrolyte used for that battery.

Applicant respectfully disagrees with the conclusion by the Office. Applicant contends that the Office has not established a *prima facie* case of obviousness in view of Narang,

Okamura and Kordesch because neither Narang, Okamura or Kordesch, alone or in combination, teach all the elements of claim 1 as arranged in the claim. More specifically, neither Narang, Okamura or Kordesch, alone or in combination, teach an electrochemical battery having an aluminum anode, a cathode comprising a solid alkali metal peroxide and a aqueous electrolyte.

The Office agrees that the two electrolytes (aqueous and non-aqueous) are not compatible, but the Office contends that the chemistry of the two batteries is well known in the art and the physical arrangement of two batteries is transferable between the two types of electrolytes and the Office contends that Kordesch teaches and supports that the physical arrangement of batteries are not limited to the type of electrolyte used for that battery. However, it is not only the physical arrangement of the batteries that is recited in the claim but also the anode/cathode/electrolyte combination which the battery is based upon. Applicant contends that the combination of an aluminum anode, a cathode comprising a solid alkali metal peroxide and a aqueous electrolyte is novel.

Clearly there are many electrochemical battery configurations known in the art. Narang teaches a metal/active oxygen battery that uses a non-aqueous electrolyte. Okamura teaches a metal/air cell that uses an aqueous electrolyte. While both types of batteries produce electricity by an electrochemical reaction, the chemical reactions taking place in the Narang cell are very different than the chemical reactions taking place in the Okamura cell. Narang teaches at col. 8, lines 49-56, using a non-aqueous electrolyte in order to avoid the parasitic reaction of lithium metal chemically reacting with water to liberate hydrogen. Narang teaches achieving a higher efficiency by using a non-aqueous electrolyte and by avoiding the metal corrosion reaction at col. 8, lines 49-56. As such, the Narang cell teaches using a non-aqueous electrolyte to avoid an undesirable side effect. In contrast, Okamura teaches at col. 2, lines 34-42, an air cell that requires oxygen (O_2) and water (H_2O) to initiate the chemical reaction at the cathode. Therefore, the electrochemical cell of Narang is clearly described as being non-aqueous and it would not be considered obvious to one skilled in the art to incorporate the same electrode configuration with an aqueous electrolyte because the goal of one skilled in the art would be to improve the energy density and efficiency of the cell and making such a substitution would result in a lower energy density and less efficient cell. As such, making such a substitution would not improve the device as suggested by the Office.

The present invention teaches an aluminum anode, a cathode comprising a solid alkali metal peroxide in combination with a aqueous electrolyte. Such a combination is not taught by the cited prior art, alone or in combination.

For the reasons indicated above, Applicant believes that amended independent claim 1 is patentable over Narang in view of Okamura and Kordesch and is believed to be in condition for allowance.

Claims 3-5, 7, 8 12-14, 16, 17, 39, 40 and 43 are dependent upon claim 1, which has been shown to be allowable, and are therefore allowable as a matter of law.

Claim 6 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Narang (US 6,991,876) in view of Okamura (US 5,476,730) and Kordesch (3,944,435) as applied to claim 1 and further in view of Momyer (US 4,001,043).

Claim 1 has been shown to be allowable. Claim 6 depends from claim 1. As such, Applicant contends that dependent claim 6 is patentable over Narang (US 6,991,876) in view of Okamura (US 5,476,730) and Kordesch (3,944,435) as applied to claim 1 and further in view of Momyer (US 4,001,043) for the reasons presented regarding the allowability of claim 1.

Claim 9 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Narang (US 6,991,876) in view of Okamura (US 5,476,730) and Kordesch (3,944,435) as applied to claim 1 and further in view of Marsh (US 5,445,905).

Claim 1 has been shown to be allowable. Claim 9 depends from claim 1. As such, Applicant contends that dependent claim 6 is patentable over Narang (US 6,991,876) in view of Okamura (US 5,476,730) and Kordesch (3,944,435) as applied to claim 1 and further in view of Marsh (US 5,445,905) for the reasons presented regarding the allowability of claim 1.

Applicant submits that this Amendment After Final Rejection at least places this application in better form for appeal. Applicant respectfully submits that this Amendment should only require a cursory review because the claim amendments presented herein do not add any new features and/or do not significantly alter the scope of the claims. Consequently, the claim amendments should not require any further search by the Examiner. This Amendment is

necessary as it clarifies and/or narrows the issues for consideration by the Board and was not earlier presented because Applicant believed that the prior response(s) placed this application in condition for allowance, for at least the reasons set forth in those response(s). Accordingly, entry of the present Amendment, as an earnest attempt to advance prosecution and/or to reduce the number of issues, is requested under 37 C.F.R. §1.116.

If the Office is not fully persuaded as to the merits of Applicant's position, or if an Examiner's Amendment would place the pending claims in condition for allowance, a telephone call to the undersigned at (813) 925-8505 is requested.

Very respectfully,



SIGNATURE OF PRACTITIONER

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CERTIFICATE OF ELECTRONIC TRANSMISSION

(37 C.F.R. 1.8 (a))

I HEREBY CERTIFY that this correspondence is being electronically transmitted to the Patent and Trademark Office through EFS Web on June 28, 2010.

Date: January 28, 2010

/jessica thompson/
Jessica Thompson